ETH1000-SFP

Gigabit Ethernet Media Converter

User manual

Rev. A

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Revision history

Current revision of this document is the uppermost in the table below.

Rev.	Repl.	Date	Sign	Change description
A	-	2014-09-22	AJM	First version

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1 Product overview

The Flashlink ETH1000-SFP is a 10/100/1000Base-T to 1000Base-X media converter module. The optical part of the card is based on SFP that makes the optical part exchangeable in field. The module converts a 10/100/1000Mbps Ethernet signal on copper to 1000Mbps optical on fibre suitable for medium haul applications. The module has one electrical Ethernet port, and one optical fibre transceiver port (receiver fibre connector and transmit fibre connector). The speed on the electrical connector is dependent of the DIP switch setting or Multicon GYDA control. Speed will upon link connection automatically be set at the highest possible speed. User can independently enable or disable 10Mbps, 100Mbps or 1000Mbps. The fibre link can be used in one or two fibre installations, or occupy two wavelengths in a WDM, CWDM or DWDM installation.

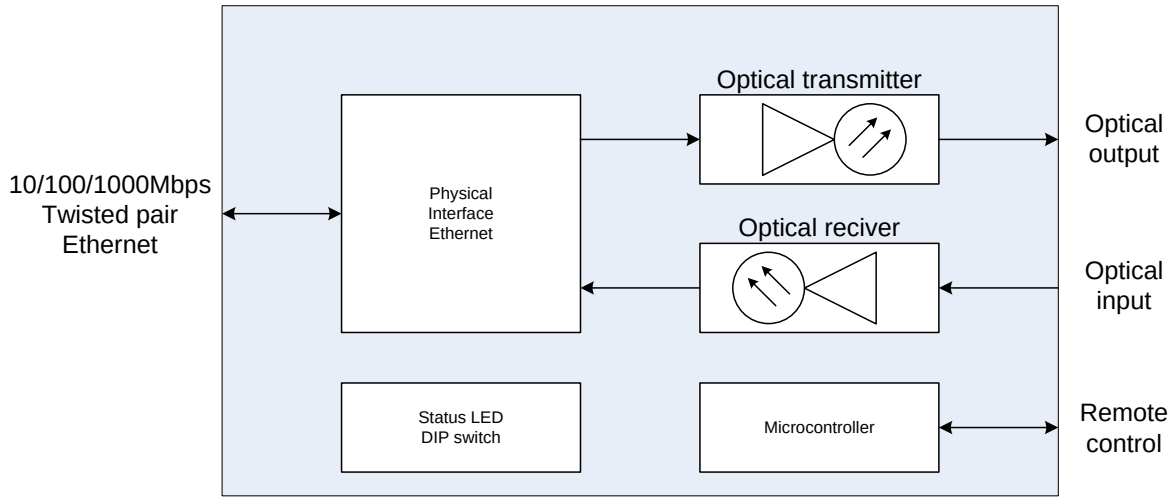


Figure 1

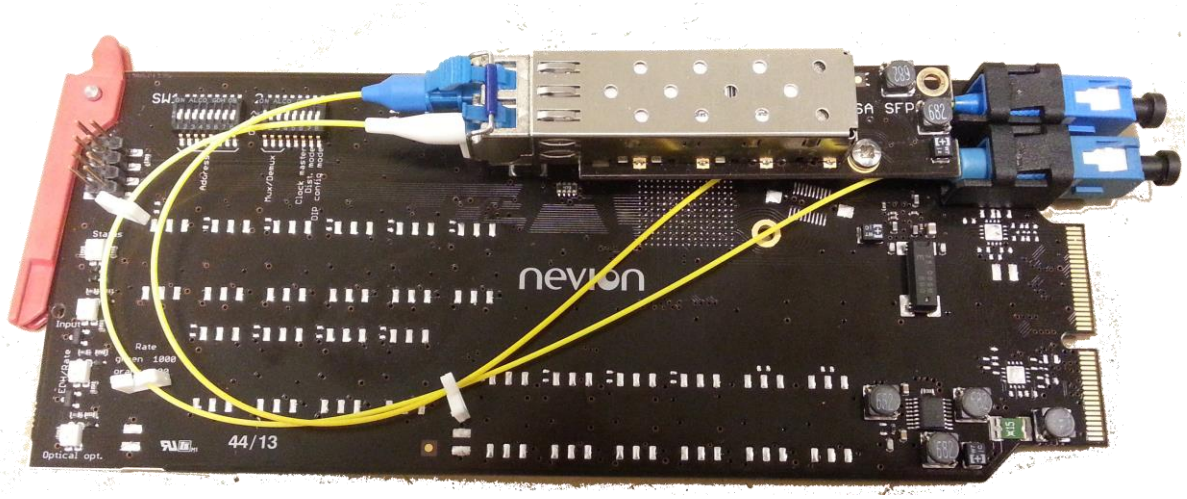


Figure 2

2 Specifications

2.1 General

Power	+5V DC / 2.0W typical with SFP +5V DC / 0.6W typical without SFP
Control	Control system for access to setup and module status with BITE (Built-In Test Equipment)
Temp. range	0 to +40 °C

2.2 Optical ports

Number of inputs	1
Number of outputs	1
Transmission circuit fiber	Single mode 9/125um
Connector	SC/UPC, single mode
Optical wavelength	~1260-1620nm
Optical sensitivity	See manual for installed SFP
Optical overload	See manual for installed SFP
Detector damage threshold	See manual for installed SFP
Optical power	See manual for installed SFP
Optical wavelength	See manual for installed SFP

2.3 Ethernet

10BaseT/100BaseTx/1000BaseT on RJ-45 connectors. Compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab and IEEE 802.3z. Auto speed sensing and MDI/MDI-X.

3 Configuration

Configuration of this card can either be done from Multicon Gyda element manager or locally on the card by dipswitches.

3.1 DIP control

The tables below explain the functionality of the dip switches.

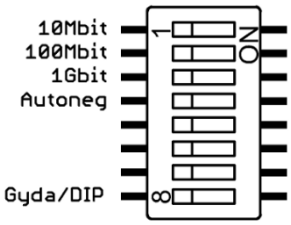


Figure 3

#	Description
1.	Enable 10Base-T
2.	Enable 100Base-T
3.	Enable 1000Base-T
4.	Auto- negotiation on 1000Base-X
5.	Reserved
6.	Reserved
7.	Reserved
8.	GYDA override/DIP

When DIP switch 1, 2 and 3 are all on or off, speed is set to auto.

DIP switch 1 enables/disables 10Base-T electrical connection.

DIP switch 2 enables/disables 100Base-T electrical connection.

DIP switch 3 enables/disables 1000Base-T electrical connection.

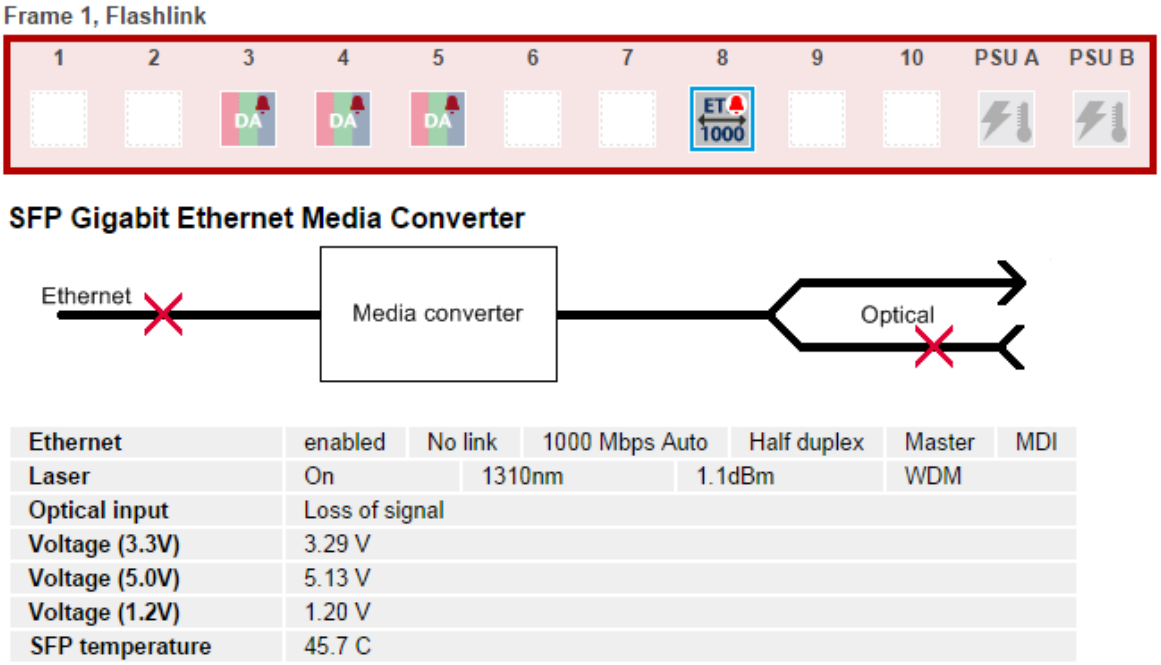
DIP switch 4 enables/disables auto-negotiation on the optical connection, 1000Base-X. When connecting ETH1000-SFP to ETH1000MC, auto-negotiation must be disabled. Using two ETH1000-SFPs this DIPs must be in the same position on both cards. Also this dip must be on to be able to communicate with other vendors Ethernet switches.

Dip 5, 6 and 7 are reserved.

Dip 8 sets if Multicon Gyda is able to configure or not. When Multicon Gyda override is set, the actual setting can be read by using the info command (se Multicon Gyda user manual for details).

3.2 Multicon Gyda configuration

Below is a snapshot from the Multicon Gyda interface.



Ethernet	enabled	No link	1000 Mbps Auto	Half duplex	Master	MDI
Laser	On	1310nm	1.1dBm	WDM		
Optical input	Loss of signal					
Voltage (3.3V)	3.29 V					
Voltage (5.0V)	5.13 V					
Voltage (1.2V)	1.20 V					
SFP temperature	45.7 C					

Alarms		
Ethernet	NEW	Acknowledge
Optical input	NEW	Acknowledge
Card removed	RESTORED	Acknowledge
Acknowledge all. 3 alarms	COMMON	Ack all

Figure 4 Multicon Gyda status tab

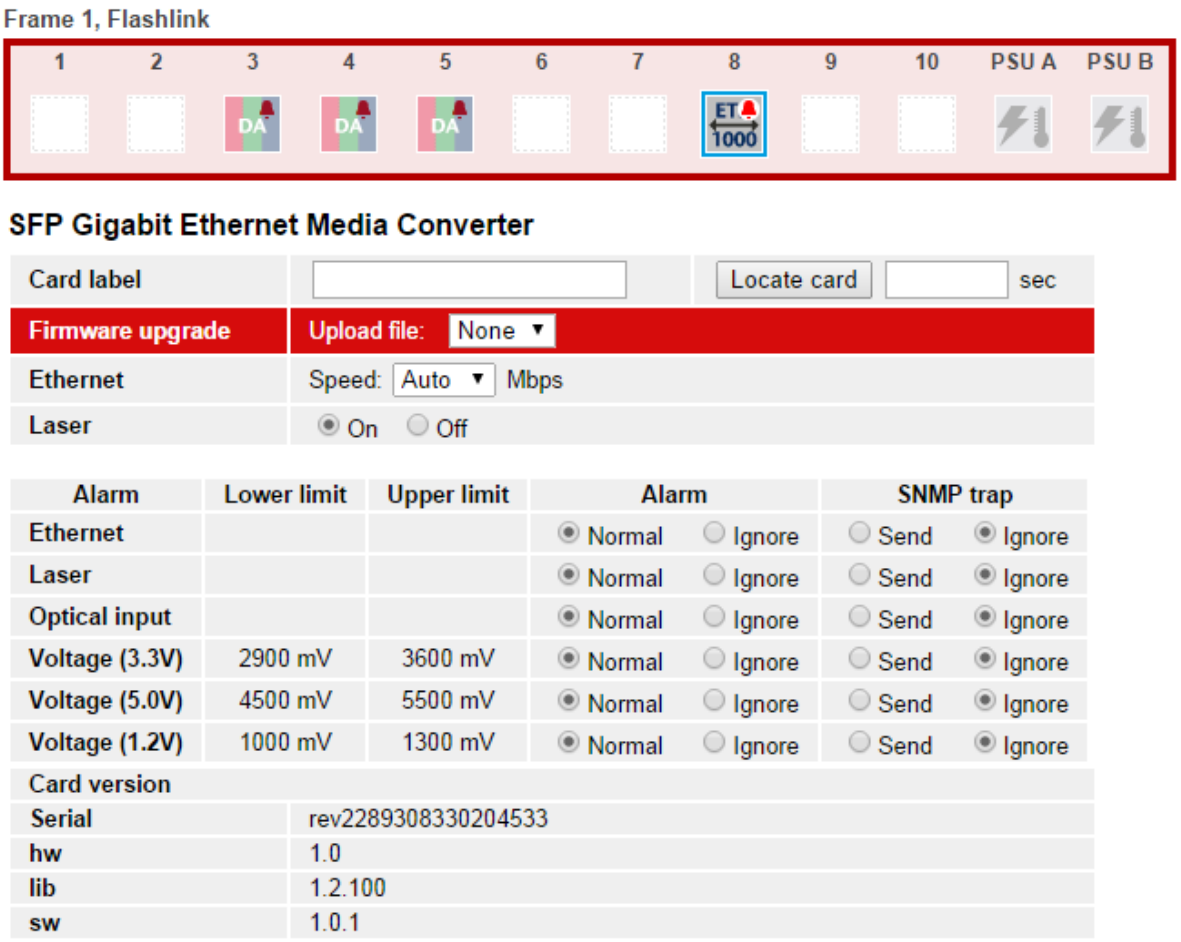

Frame 1, Flashlink
1 2 3 4 5 6 7 8 9 10 PSU A PSU B
DA DA DA ET 1000
SFP Gigabit Ethernet Media Converter
Card label
Locate card
sec
Firmware upgrade
Upload file: None
Ethernet
Speed: Auto Mbps
Laser
On Off
Alarm Lower limit Upper limit Alarm SNMP trap
Ethernet Normal Ignore Send Ignore
Laser Normal Ignore Send Ignore
Optical input Normal Ignore Send Ignore
Voltage (3.3V) 2900 mV 3600 mV Normal Ignore Send Ignore
Voltage (5.0V) 4500 mV 5500 mV Normal Ignore Send Ignore
Voltage (1.2V) 1000 mV 1300 mV Normal Ignore Send Ignore
Card version
Serial rev2289308330204533
hw 1.0
lib 1.2.100
sw 1.0.1

Figure 5 Multicon Gyda config tab

4 Connector module

The ETH1000-MKII has a dedicated connector module: ETH1000-C1. This module is mounted at the rear of the sub-rack. The module is shown in the figure below.

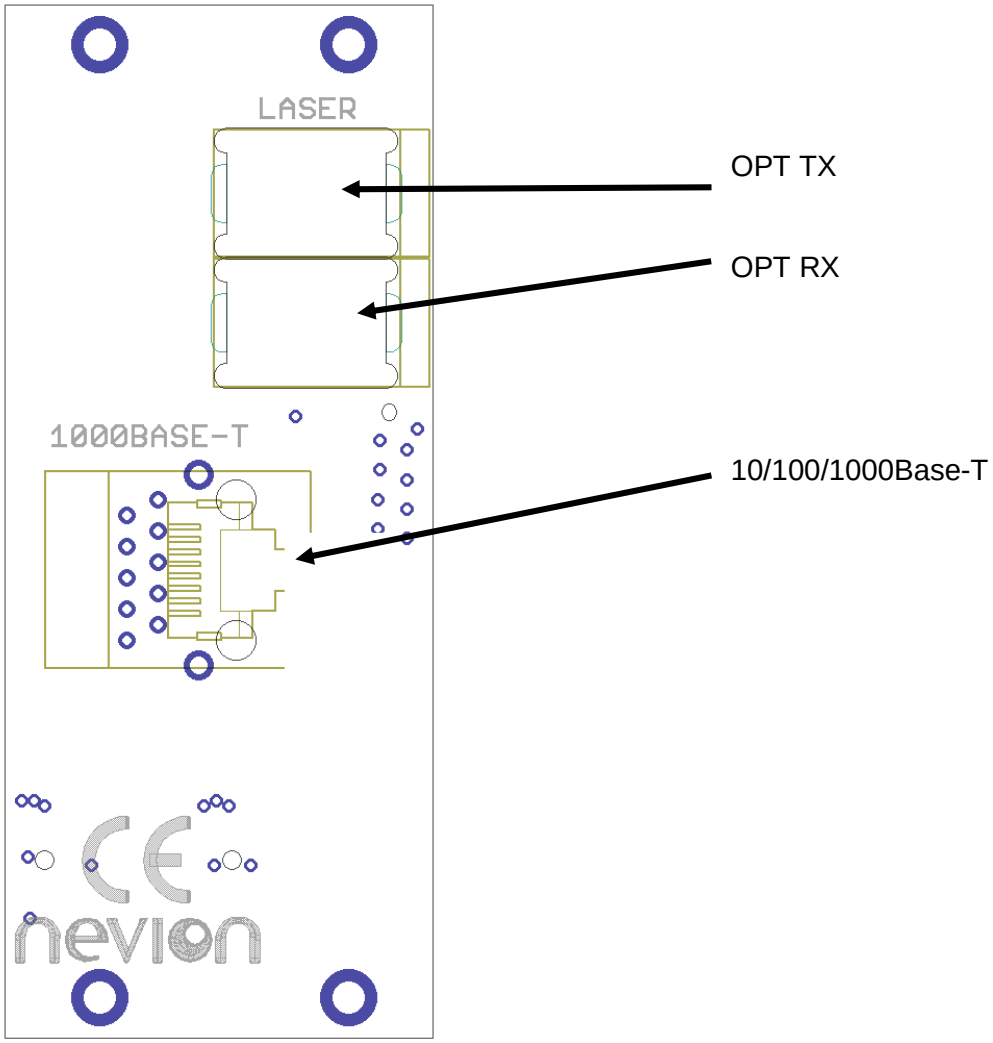


Figure 6

4.1 Mounting the connector module

The details of how the connector module is mounted, is found in the user manual for the sub-rack frame FR-2RU-10-2.

This manual is also available from our web site:

http://www.nevion.com/.

4.2 Terminal format support

The different input and output ports on ETH1000-MKII can support a number of formats. The table below shows the input and output signals on the back plane.

Terminal format support:

Terminal	Function	Supported Format	Mode
OPT RX	Optical input	1000Base-X	Input
OPT TX	Optical output	1000Base-X	Output
1000Base-T	Electrical input	10/100/1000Base-T	In/output

5 Module status

The status of the module can be monitored in two ways.

1. GYDA-SC System Controller (optional).
2. LED's at the front of the sub-rack.

Of these two, the LEDs are mounted on the module itself, whereas the GYDA System Controller is a separate module giving detailed information on the card status. The functions of the the LEDs are described in sections **Error! Reference source not found.** and 5.1. GYDA-SC is described in a separate user manual

5.1 Front panel – Status monitoring

The status of the module can be easily monitored visually by the LEDs at the front of the module. The LEDs are visible through the front panel as shown in the figure below.

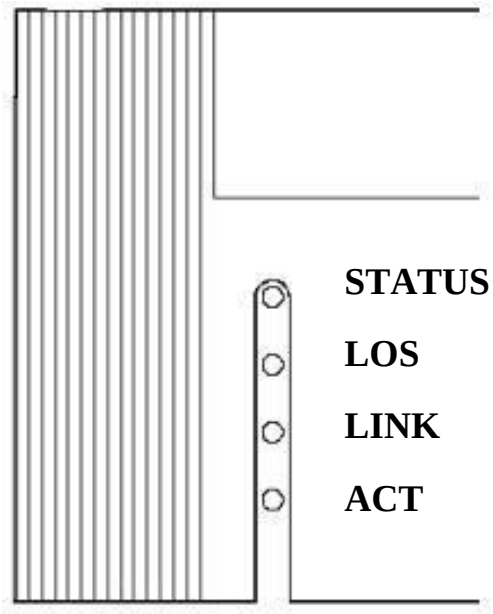


Figure 7 - Front panel indicators for the ETH1000-MKII

ETH1000-MKII has 4 LEDs each showing a status corresponding to the GPI pinning.

Diode \ State	**Red LED**	**Green LED**	**Orange LED**	**No light**
Status	Module is faulty, or module is initializing.	Module is OK Module power is OK	Laser off	Module has no power
LOS	No optical signal	Optical signal		Module has no power
LINK	N/A	1000Base-T link	10/100/Base-T link	No link
ACT		Ethernet traffic		No Ethernet traffic

6 Laser safety precautions

Guidelines to limit hazards from laser exposure.

All the available EO units in the Flashlink range include a laser.

Therefore this note on laser safety should be read thoroughly.

The lasers emit light at 1310 nm or 1550 nm. This means that the human eye cannot see the beam, and the blink reflex cannot protect the eye. (The human eye can see light between 400 nm to 700 nm).

A laser beam can be harmful to the human eye (depending on laser power and exposure time), therefore:

Be careful when connecting / disconnecting fibre pigtails (ends).
Never look directly into the pigtail of the laser/fibre.
Never use microscopes, magnifying glasses or eye loupes to look into a fibre end.
Use laser safety goggles blocking light at 1310 nm and at 1550 nm

Instruments exist to verify light output power: Power meters, IR-cards etc.

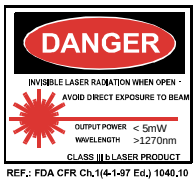
Flashlink features:

All the laser module cards in the Flashlink ETH1000-MKII range, are Class 1 laser ETH1000-MKIIs according to IEC 825-1 1993, and class I according to 21 CFR 1040.10 when used in normal operation.

More details can be found in the user manual for the FR-2RU-10-2 frame.

Maximum output power[1]: 5 mW.

Operating wavelengths: > 1270 nm.



[1] Max power is for safety analysis only and does not represent device performance.

General environmental requirements for Nevion equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:
   - Operating room temperature range: 0°C to 40°C
   - Operating relative humidity range: <90% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:
   - Temperature range: -10°C to 55°C
   - Relative humidity range: <95% (non-condensing)

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Nevion, which are available on the company web site:

www.nevion.com

Appendix A Materials declaration and recycling information

A.1 Materials declaration

For product sold into China after 1st March 2007, we comply with the “Administrative Measure on the Control of Pollution by Electronic Information Products”. In the first stage of this legislation, content of six hazardous materials has to be declared. The table below shows the required information.

組成名稱 Part Name	Toxic or hazardous substances and elements					
	鉛 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr(VI))	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
ETH1000-MKII	O	O	O	O	O	O

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

This is indicated by the product marking:

A.2 Recycling information

Nevion provides assistance to customers and recyclers through our web site http://www.nevion.com/. Please contact Nevion’s Customer Support for assistance with recycling if this site does not show the information you require.

Where it is not possible to return the product to Nevion or its agents for recycling, the following general information may be of assistance:

- Before attempting disassembly, ensure the product is completely disconnected from power and signal connections.
- All major parts are marked or labeled to show their material content.
- Depending on the date of manufacture, this product may contain lead in solder.
- Some circuit boards may contain battery-backed memory devices.